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S94-C-38

FLOOD INSURANCE STUDY

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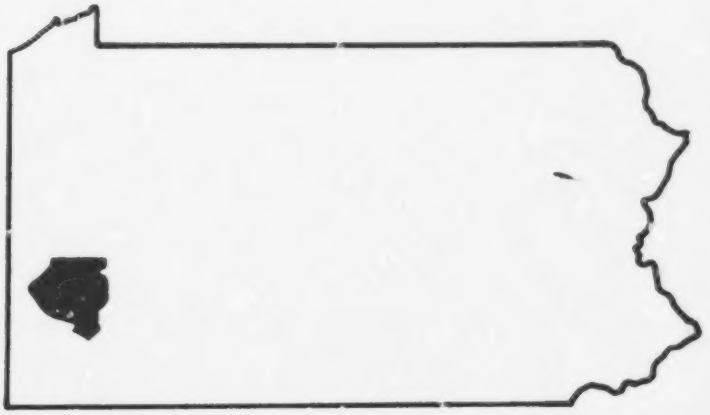
TOWNSHIP OF OHIO, PENNSYLVANIA
ALLEGHENY COUNTY



NOVEMBER 4, 1988

COMPLETED

Federal Emergency Management Agency

COMMUNITY NUMBER - 421089

ORIGINAL

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance study purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY
TOWNSHIP OF OHIO, ALLEGHENY COUNTY, PENNSYLVANIA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Township of Ohio, Allegheny County, Pennsylvania, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by the Pittsburgh District of the U. S. Army Corps of Engineers (COE) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-85-E-1822, Project Order No. 1, Amendment No. 25. This work was completed in March 1987.

1.3 Coordination

An initial Consultation and Coordination Officer's (CCO) meeting was held on May 22, 1985, with representatives of FEMA, the Pennsylvania Department of Community Affairs, and the COE (the study contractor) to identify the streams to be studied by detailed methods. On November 30, 1987, a final CCO meeting was held with representatives of FEMA, the township, and the study contractor to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Township of Ohio, Allegheny County, Pennsylvania. The area of study is shown on the Vicinity Map (Figure 1).

Lowries Run was studied by detailed methods for its entire length within the community. Bear Run was studied by detailed methods from its confluence with Lowries Run to the upstream corporate limits. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through March 1992.

Toms Run and an unnamed tributary were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the Township of Ohio.

2.2 Community Description

The Township of Ohio is located in the northwestern section of Allegheny County in southwestern Pennsylvania. It is bordered by the Township of Ross to the east, the Borough of Franklin Park to the north, the Township of Kilbuck to the south, and the Borough of Sewickley Heights to the west. The total land area contained within the Township of Ohio is 6.8 square miles. Ohio had a population of 2,072 in 1980, a 1 percent decrease from the 1970 population of 2,096 (Reference 1).

Lowries Run, with a total drainage area of 17 square miles at its mouth, has its source in the Town of McCandless and the Borough of Franklin Park. It flows generally south for more than half its length through the Township of Ross and then turns generally west-southwest through the Township of Ohio and on to where it meets the Ohio River. Lowries Run has a narrow to moderate floodplain in Ohio. The average stream slope is approximately 35 feet per mile. Above the stream's valley, the local relief varies from a low of 800 feet to an average hilltop elevation of 1,140 feet.

Bear Run, with a total drainage area of 5.37 square miles, has its source in the Township of Franklin. It flows in a southeast direction to where it meets Lowries Run in the Township of Ohio. The average stream slope in the community is approximately 53 feet per mile. Above the stream's valley, the local relief varies from a low of 830 feet to an average hilltop elevation of 1,200 feet.

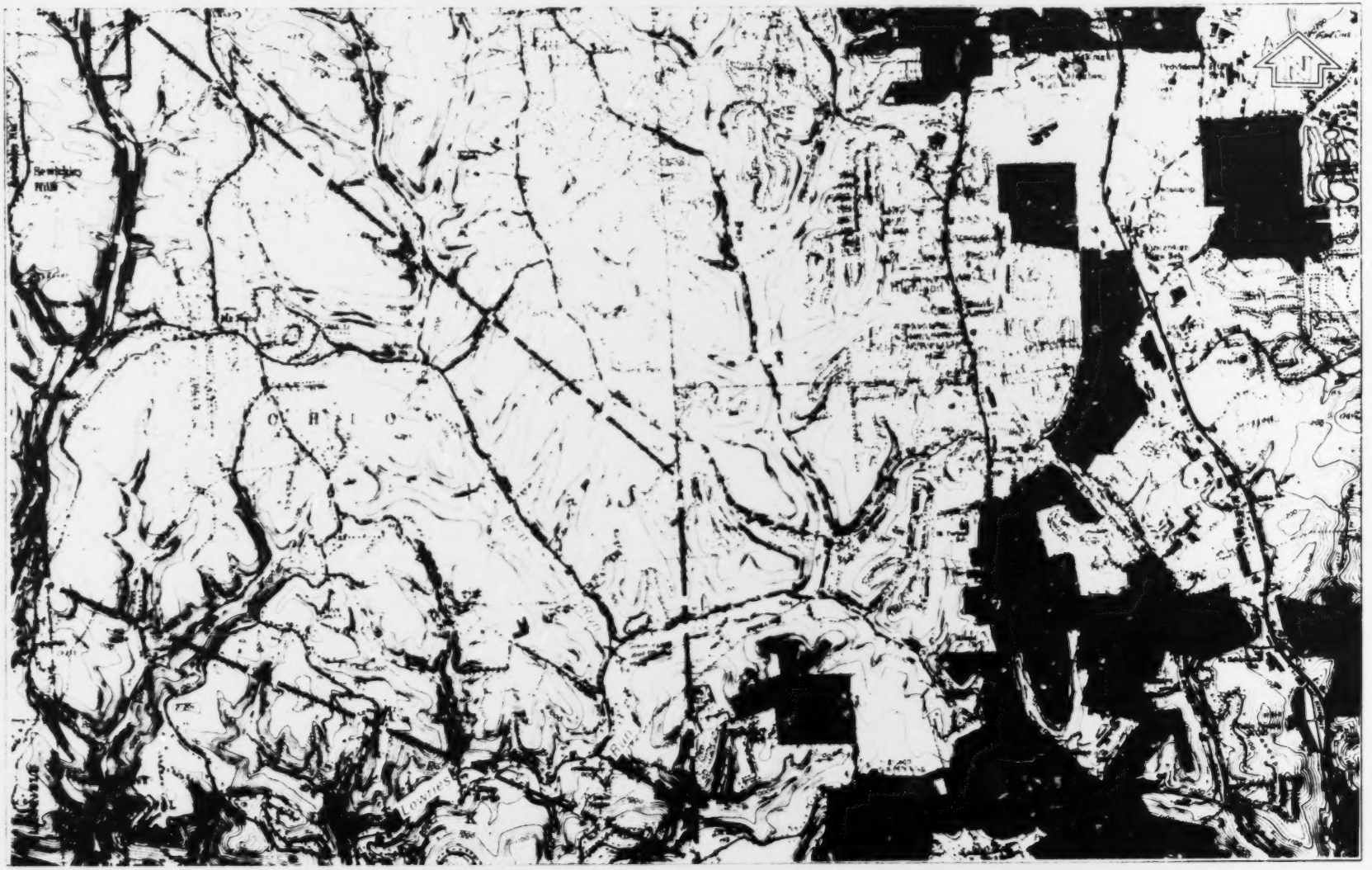

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF OHIO, PA
(ALLEGHENY CO.)

APPROXIMATE SCALE

3,600 0 3,600 7,200 10,800 FEET

VICINITY MAP

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The climate for this area is temperate, with seasonal variation in temperature. The area is located in a region of variable air mass activity, subjected to both polar and tropical, and continental and maritime air mass invasions. The weather is usually moderate but is subject to frequent and rapid changes as a result of air mass movements. Measurable precipitation occurs approximately 147 days a year and amounts to approximately 36 inches. Average monthly temperatures range from 31 degrees Fahrenheit (^{o}F) in January to 74^{o}F in July.

2.3 Principal Flood Problems

The principal flood problem in the Township of Ohio is the potential for flash flooding. The highest known flood for Lowries Run occurred in July 1950; however, no high-water marks are available. There is no record of major flooding on Bear Run.

2.4 Flood Protection Measures

At present there are no flood protection projects on Lowries and Bear Runs that would affect flooding in the Township of Ohio.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. A flood event of a magnitude which is expected to be equaled or exceeded once on the average during any 100-year period (recurrence interval) has been selected as having special significance for floodplain management and for flood insurance rates. This event, commonly termed the 100-year flood, has a 1 percent chance of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

The 100-year flow for Lowries Run was based primarily on an analysis of stream gage records. Gage records are available from 1959 to 1973 at stream mile 0.783 and from 1973 to date at stream mile 0.571, 0.897, and 1.109. These records were analyzed and a frequency developed by using the standard log-Pearson Type III method as outlined in Bulletin 17B (Reference 2). Because of the short period of record, another method of computing flows was tried: flows were computed using multiple regression formulae developed by the Pittsburgh District COE (Reference 3). These formulae are based on parameters determined from a study of frequencies of small streams in the Pittsburgh District. These parameters include drainage area, stream slope, and basin shape. After comparing the flows as developed by the two methods, it was decided to use the flows as computed by the gage records. The July 1950 flood was assigned a flow of 4,800 cubic feet per second (cfs) as computed by the USGS slope/area method curve and was used as a high outlier. The period of record used was from 1959 to 1976. The drainage area at the mouth is 17.0 square miles.

The 100-year flow for Bear Run was developed using multiple regression formulae (Reference 3).

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGE (cfs) 100-YEAR
LOWRIES RUN		
At downstream corporate limits	14.80	5,780
Upstream of confluence of Bear Run	7.83	2,440
BEAR RUN		
At confluence with Lowries Run	5.37	1,740

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross-sectional data for Lowries Run were obtained from COE field sections and topographic maps at a scale of 1:1,200 (Reference 4). Cross-sectional data for Bear Run were obtained from field sections

and topographic maps at a scale of 1:1,200 (References 5 and 4). Detail bridge data were obtained from construction drawings and field measurements (Reference 6).

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1) and the Flood Insurance Rate Map (Exhibit 2) where applicable.

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 7). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. The starting water-surface elevation for Lowries Run was obtained from the Flood Insurance Study for the Township of Kilbuck (Reference 8). The starting water-surface elevation for Bear Run assumed critical depth at its mouth. The results of the water-surface computations are tabulated for selected cross sections (Table 2).

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment on the basis of similar streams in the area. For Lowries Run, the channel "n" values ranged from 0.025 to 0.040, and the overbank "n" values ranged from 0.060 to 0.080. For Bear Run, the channel "n" values ranged from 0.018 to 0.040, and the overbank "n" value was 0.080.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100-year floodplain boundaries to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. For the streams

FLOODING SOURCE		STREAM CHANNEL			LEFT OVERBANK			RIGHT OVERBANK			100 YEAR FLOOD WATER SURFACE ELEVATION
CROSS SECTION	DISTANCE[1] MILES	WIDTH (FT.)	DISCHARGE (CFS)	MEAN VELOCITY (FT./SEC.)	WIDTH (FT.)	DISCHARGE (CFS)	MEAN VELOCITY (FT./SEC.)	WIDTH (FT.)	DISCHARGE (CFS)	MEAN VELOCITY (FT./SEC.)	
Lowries Run											
A	2.257	72	4,642	10.8	205	307	1.7	7	32	2.3	803.2
B	2.425	87	4,930	11.9	4	3	1.3	35	48	1.9	816.0
C	2.549	40	3,365	9.5	0	0	0	180	1,615	3.0	821.9
D	2.652	51	3,861	10.2	133	308	1.8	12	11	1.2	826.5
E	2.827	42	1,872	4.5	10	51	1.1	199	2,257	1.8	834.0
F	2.875	33	1,821	5.5	20	141	1.5	184	2,214	2.0	834.1
G	2.991	27	2,050	9.4	265	2,130	3.0	0	0	0	836.4
H	3.119	53	1,651	5.7	366	2,529	2.1	0	0	0	839.4
I	3.199	57	3,886	10.3	14	33	1.8	58	261	2.4	843.6
J	3.255	31	1,281	5.1	32	33	0.9	177	1,087	1.7	846.9
K	3.281	32	1,361	5.6	6	22	1.3	258	1,017	1.6	846.6
L	3.485	30	1,658	11.0	0	0	0	110	742	3.5	852.8

[1]Miles above mouth

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF OHIO, PA
(ALLEGHENY COUNTY)

REGULATORY DATA

LOWRIES RUN

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FLOODING SOURCE		STREAM CHANNEL			LEFT OVERBANK			RIGHT OVERBANK			100 YEAR FLOOD WATER SURFACE ELEVATION
CROSS SECTION	DISTANCE[1] (FT.)	WIDTH (FT.)	DISCHARGE (CFS)	MEAN VELOCITY (FT./SEC.)	WIDTH (FT.)	DISCHARGE (CFS)	MEAN VELOCITY (FT./SEC.)	WIDTH (FT.)	DISCHARGE (CFS)	MEAN VELOCITY (FT./SEC.)	
Bear Run											
A	127	36	1,543	9.6	48	149	2.4	49	47	1.4	843.6
B	500	42	1,446	7.1	85	294	1.9	0	0	0	845.5
C	1,100	27	660	6.4	230	1,080	2.4	0	0	0	848.9
D	1,700	30	989	8.7	196	614	2.3	21	137	3.0	854.8
E	4,185	28	1,175	9.2	176	521	1.9	10	44	2.2	875.1
F	4,852	29	1,576	10.9	57	86	1.6	12	78	2.7	882.6
G	5,411	31	1,157	8.4	0	0	0	213	583	2.0	887.7
H	6,090	36	1,400	10.8	0	0	0	0	0	0	893.0
I	7,000	29	1,394	11.6	0	0	0	4	6	1.7	903.9
J	8,265	40	1,400	10.4	0	0	0	0	0	0	912.5
K	9,050	8	384	8.6	63	622	3.1	24	394	3.8	919.0
L	10,156	27	1,289	11.4	14	108	3.2	6	3	1.0	928.8
M	10,848	30	1,152	8.3	44	191	2.4	51	56	1.4	935.3
N	12,190	15	941	10.2	15	99	3.1	135	361	2.4	950.4

[1] Distance in Feet Above Mouth

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF OHIO, PA.
(ALLEGHENY COUNTY)

REGULATORY DATA

BEAR RUN

studied in detail, the 100-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:1,200 with a contour interval of 1 foot and at a scale of 1:24,000 with a contour interval of 20 feet (References 4 and 9).

For the streams studied by approximate methods, the boundary of the 100-year flood has been delineated using the Flood Hazard Boundary Map for the Township of Ohio (Reference 10).

The 100-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

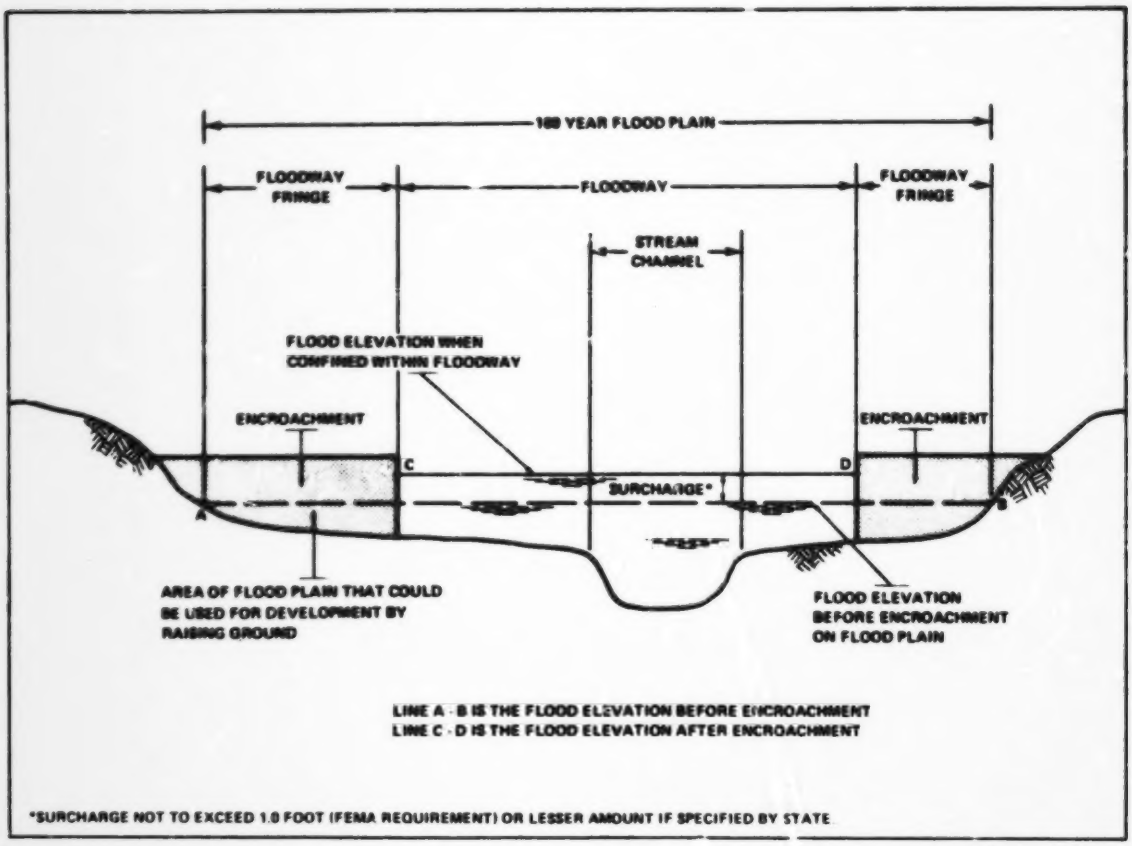
Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

No floodways were calculated as part of this study.

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

FLOODWAY SCHEMATIC

Figure 2

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

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Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain,and to areas of 100-year flooding where average depths are less than 1 foot, areas of 10-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100-year floodplain. The locations of selected cross sections used in the hydraulic analyses are shown where applicable.

7.0 OTHER STUDIES

Flood Insurance Studies have been prepared for the Townships of Kilbuck and Ross (References 8 and 11). The results of this study are in complete agreement with the results of those studies.

Due to its more detailed nature, this study supersedes the Flood Hazard Boundary Map for the Township of Ohio (Reference 10). A major highway, Interstate Route 279 or Legislative Route 1021 (Section 6A, 6B), is currently under construction by the Pennsylvania Department of Highways. This highway goes through the Township of Ohio. Because of its locations within the township, Lowries and Bear Runs will be affected. For Bear Run, there will be major channel relocations and new culverts built. For Lowries Run, only new culverts will be constructed. Proposed completion date for this highway is the fall of 1988. This Flood Insurance Study assumes the new highway is in place. All the proposed construction data were obtained from the Pennsylvania Department of Transportation, District 11, Greentree, Pennsylvania.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, Liberty Square Building (Second Floor), 105 South Seventh Street, Philadelphia, Pennsylvania 19106.

9.0 BIBLIOGRAPHY AND REFERENCES

1. U. S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Pennsylvania, Washington, D. C., U. S. Government Printing Office, 1981.

2. U. S. Department of the Interior, Geological Survey, Office of Water Data Collection, Interagency Advisory Committee on Water Data, "Guidelines for Determining Flood Flow Frequency," Bulletin 17B, Reston, Virginia, Revised September 1981.

3. U. S. Army Corps of Engineers, Pittsburgh District, "Untitled Regression Data," Pittsburgh, Pennsylvania, 1975.

4. Pennsylvania Department of Transportation, Bureau of Highway Design, District 11, Topographic Maps compiled from aerial photographs, prepared for Sections 6A and 6B of Interstate Route 279, Scale 1:1,200, Contour Interval 1 Foot, March and April 1979.

5. Pennsylvania Department of Transportation, Bureau of Highway Design, District 11, prepared for Allegheny County Legislative Route 1021 (Interstate Route 279) Section 6B, Station 384+50 to Station 576+50, Scale 1" = 50'.

6. Pennsylvania Department of Transportation, Bureau of Highway Design, District 11, prepared for Allegheny County Legislative Route 1021 (Interstate Route 279) Section 6A and 6B, Construction Drawings for Bridges and Culverts Relocations over Lowries and Bear Runs.

7. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, October 1973.

8. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Township of Kilbuck, Allegheny County, Pennsylvania, Washington, D. C., February 1, 1980.

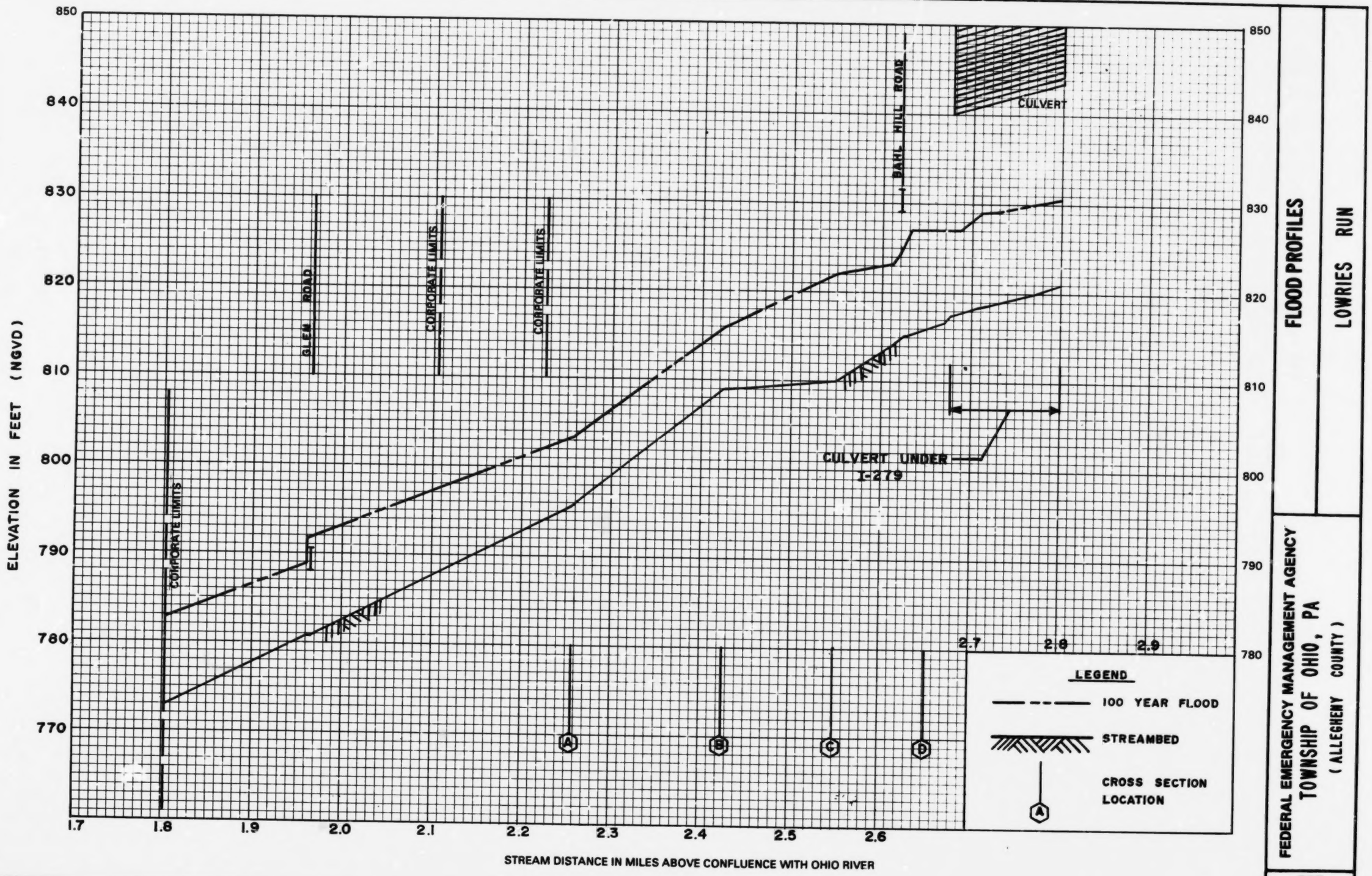
9. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 Feet: Emsworth, Pennsylvania, Photorevised 1979.

10. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Township of Ohio, Allegheny County, Pennsylvania, June 4, 1976.

11. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Township of Ross, Allegheny County, Pennsylvania, Washington, D. C., December 18, 1979.

EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 1	01	936.35	Along McAleer Road approximately 0.3 mile upstream of intersection with Lowries Run and Mt. Nebo Road, an L cut on top of upstream left bank corner of concrete headwall of twin CMP culvert bridge over tributary to Bear Run.
RM 2	03	778.73	Chiseled cross cut in northwest abutment, downstream side of access road bridge over Lowries Run in Avonworth Park located approximately 300 feet south of intersection of road with Camp Horne Road.
RM 3	03	789.99	Along Glen Road, U cut on top of upstream right bank bridge seat over Lowries Run, approximately 1.5 feet landward of upstream creek corner.
RM 4	03	838.66	Top of U cut on top of upstream side of concrete bridge at centerline over Lowries Run.
RM 5	03	843.02	Chiseled square cut on top of left bank abutment at upstream end by start of wing wall of bridge over Lowries Run at Green Valley Golf Course.
RM 6	03	871.70	Top of L cut on downstream left bank corner of abutment of culvert underneath Lowries Run and Mt. Nebo Road.



FLOOD PROFILES

LOWRIES RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY
TOWNSHIP OF OHIO, PA
(ALLEGHENY COUNTY)

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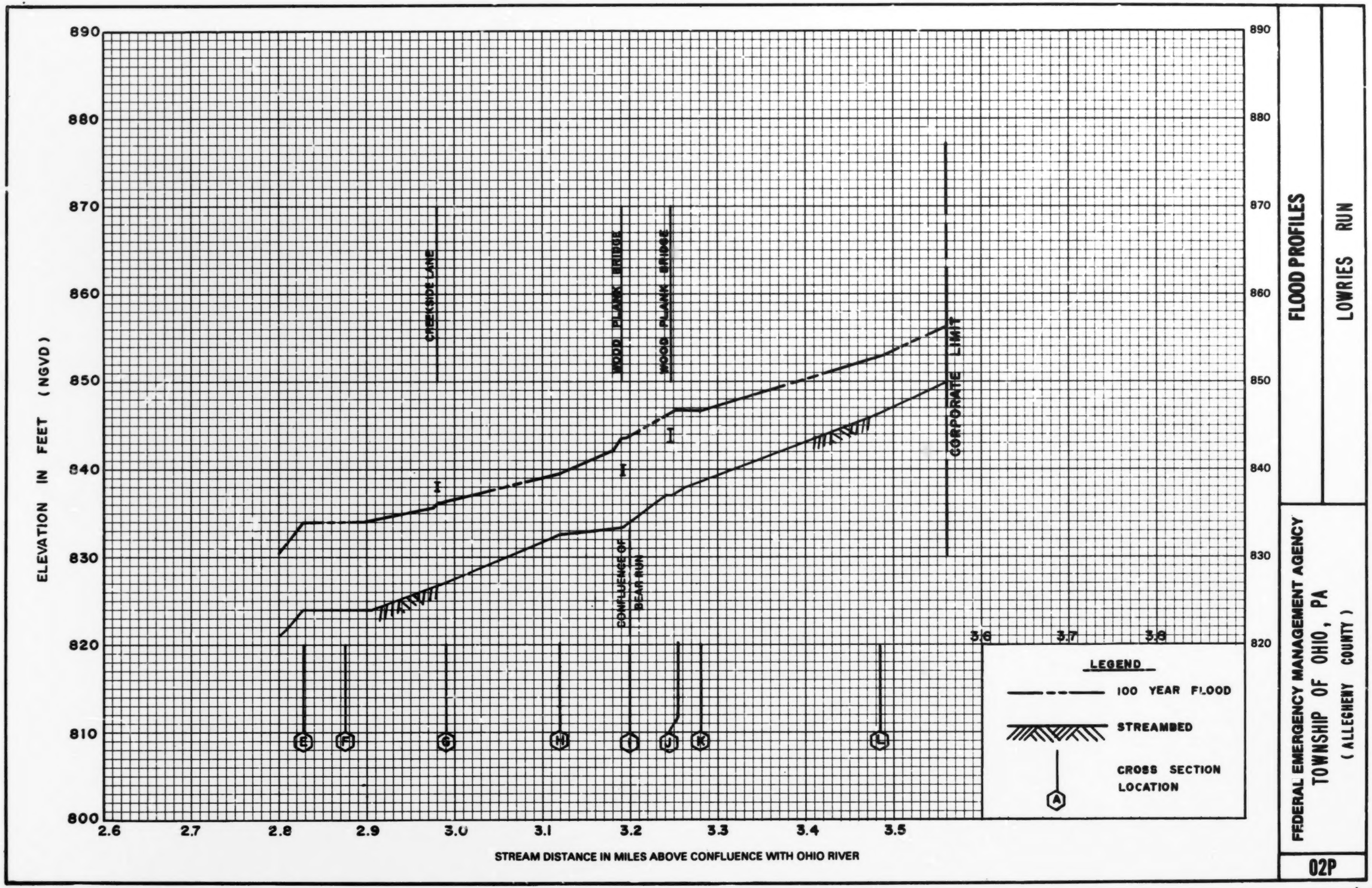

FLOOD PROFILES

LOWRIES RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY
TOWNSHIP OF OHIO, PA
(ALLEGHENY COUNTY)

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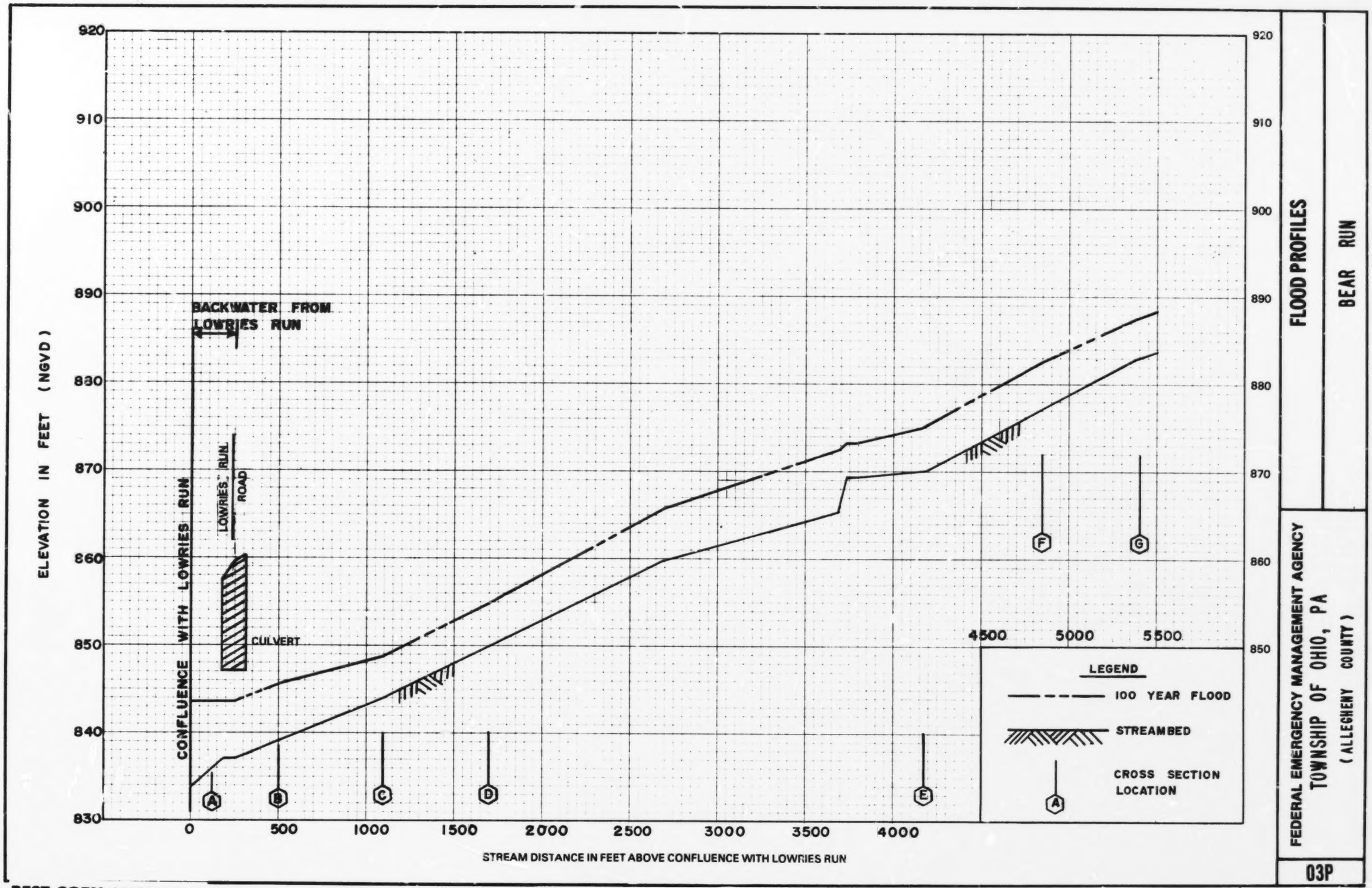

FLOOD PROFILES

BEAR RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF OHIO, PA

(ALLEGHENY COUNTY)

03P

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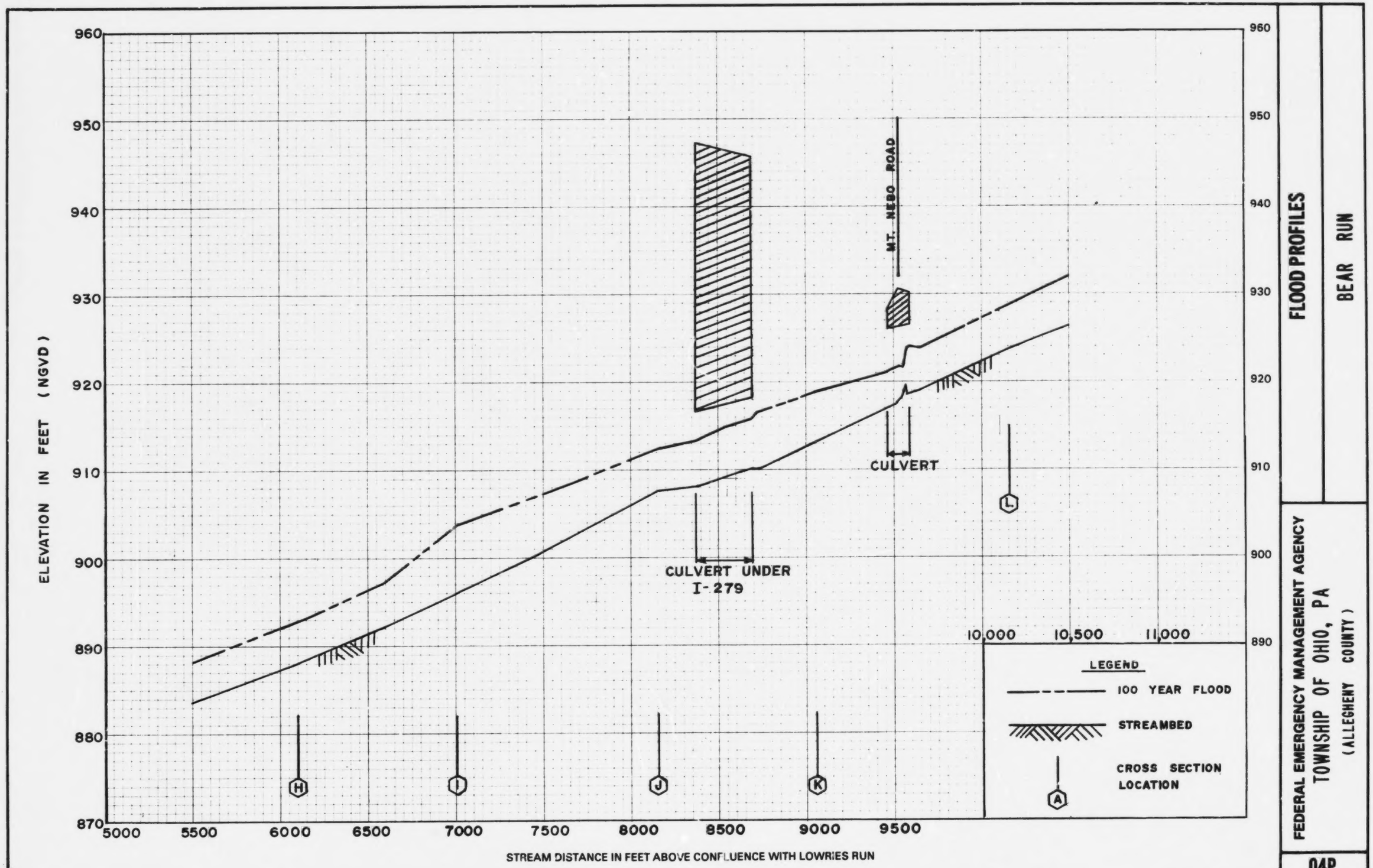

FLOOD PROFILES

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TOWNSHIP OF OHIO, PA

(ALLEGHENY COUNTY)

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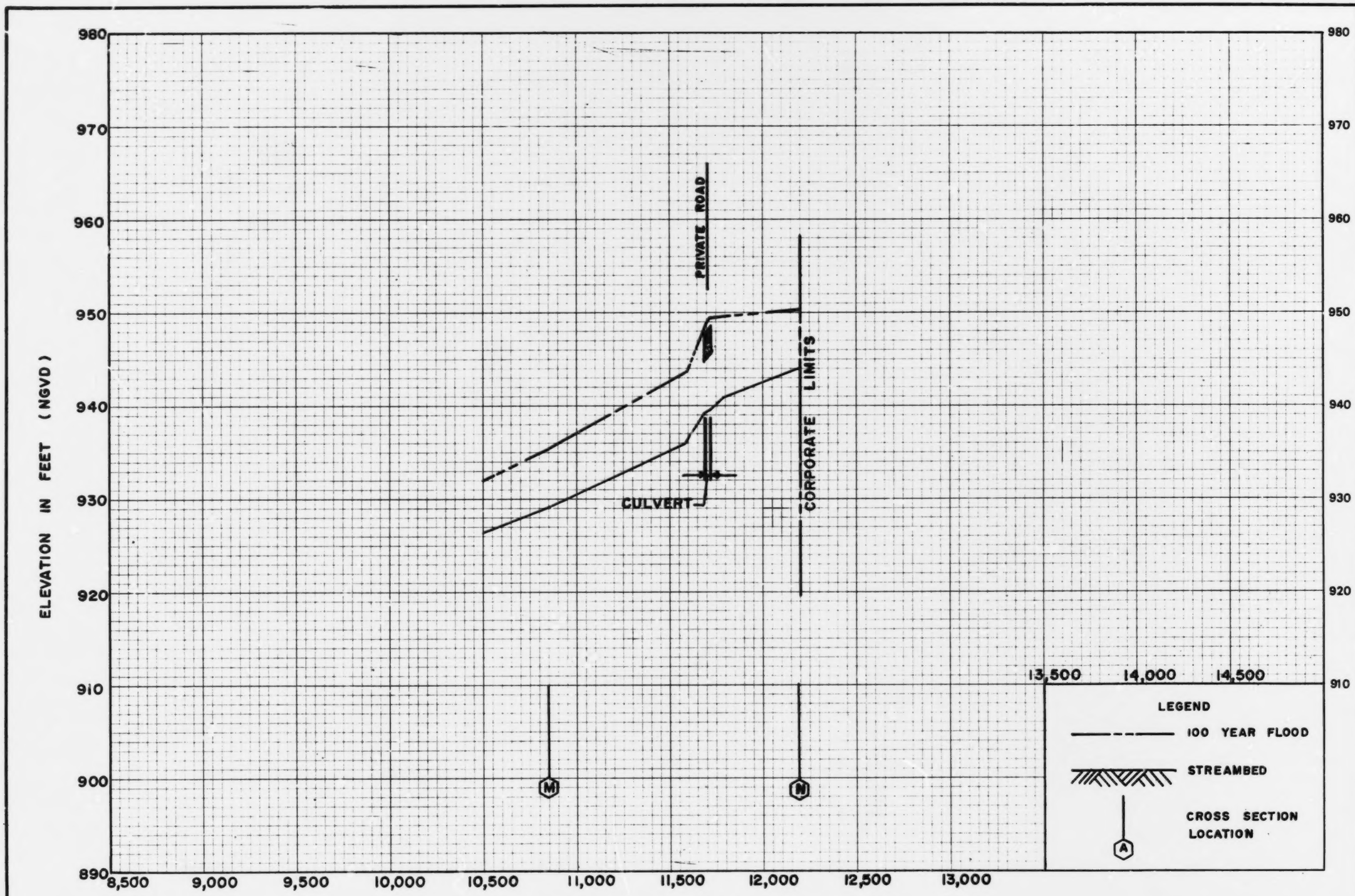

FLOOD PROFILES

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